Name: Date:

Polynomial Factoring solution (version 642)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 24 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(24)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 96}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-80}}{2}$$

$$x = \frac{-4 \pm \sqrt{-16 \cdot 5}}{2}$$

$$x = \frac{-4 \pm 4\sqrt{5}\, i}{2}$$

$$x = -2 \pm 2\sqrt{5}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $4 - 3i$ and $9 + 6i$ in standard form $(a + bi)$.**

Solution

$$(4 - 3i) \cdot (9 + 6i)$$

$$36 + 24i - 27i - 18i^2$$

$$36 + 24i - 27i + 18$$

$$36 + 18 + 24i - 27i$$

$$54 - 3i$$

Polynomial Factoring solution (version 642)

3. **Write function $f(x) = x^3 - 2x^2 - 11x + 12$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

$$\begin{array}{c|cccc} & 1 & -2 & -11 & 12 \\ 4 & & 4 & 8 & -12 \\ \hline & 1 & 2 & -3 & 0 \end{array}$$

$$f(x) = (x-4)(x^2+2x-3)$$

$$f(x) = (x-4)(x-1)(x+3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+8)\cdot(x+3)^2\cdot(x-1)$$

Sketch a graph of polynomial $y = p(x)$.